

What is claimed is:

1. A method of chemical mechanical polishing a metal layer on a substrate, comprising:
polishing the substrate at a first polishing station with a first polishing surface at a
first polishing rate;

monitoring polishing at the first polishing station with an eddy current monitoring
system;

transferring the substrate to a second polishing station when the eddy current
monitoring system indicates that a predetermined thickness of the metal layer remains on the
substrate;

polishing the substrate at the second polishing station with a second polishing surface
at a second polishing rate that is lower than the first polishing rate;

monitoring polishing at the second polishing station with an optical monitoring
system; and

halting polishing when the optical monitoring system indicates that a first underlying
layer is at least partially exposed.

2. The method of claim 1, wherein the first underlying layer is a barrier layer.

3. The method of claim 2, further comprising transferring the substrate to a third
polishing station and polishing the substrate with a third polishing surface.

4. The method of claim 3, further comprising monitoring polishing at the third polishing
station with a second optical monitoring system, and halting polishing when the second
optical monitoring system indicates that a second underlying layer is at least partially
exposed.

5. The method of claim 3, wherein polishing at the third polishing station continues until
the second underlying layer is substantially entirely exposed.

6. The method of claim 1, wherein polishing at the second polishing station continues

until the first underlying layer is substantially entirely exposed.

7. The method of claim 1, wherein polishing the substrate at the second polishing station includes an initiation polishing step at a higher pressure than the remaining polishing at the second polishing station.

8. A method of chemical mechanical polishing a metal layer on a substrate, comprising:
polishing the substrate at a first polishing station with a first polishing surface at a first polishing rate;

monitoring polishing at the first polishing station with an eddy current monitoring system;

reducing the polishing rate at the first polishing station when the eddy current monitoring system indicates that a predetermined thickness of the metal layer remains on the substrate;

monitoring polishing at the first polishing station with an optical monitoring system;
and

halting polishing when the optical monitoring system indicates that a first underlying layer is at least partially exposed.

9. The method of claim 8, wherein the first underlying layer is a barrier layer.

10. The method of claim 8, further comprising transferring the substrate to a second polishing station and polishing the substrate with a second polishing surface.

11. The method of claim 3, further comprising monitoring polishing at the second polishing station with a second optical monitoring system, and halting polishing when the second optical monitoring system indicates that a second underlying layer is at least partially exposed.

12. The method of claim 11, further comprising transferring the substrate to a third polishing station and buffing the substrate with a buffing surface.

13. The method of claim 8, wherein polishing at the second polishing station continues until the first underlying layer is substantially entirely exposed.

- 5 14. A method of chemical mechanical polishing a metal layer on a substrate, comprising:
polishing the substrate at a first polishing rate;
monitoring polishing with an eddy current monitoring system;
reducing the polishing rate when the eddy current monitoring system indicates that a
predetermined thickness of the metal layer remains on the substrate;
10 monitoring polishing with an optical monitoring system; and
halting polishing when the optical monitoring system indicates that an underlying
layer is at least partially exposed.